

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

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In the Application of: Vogel et al.

CASE NO: AD6728 US NA

APR 03 2007

APPLICATION NO.: 09/833,452

GROUP ART UNIT: 1773

FILED: 04/12/2001

EXAMINER: Jackson, Monique R

FOR: Multi-Layered, Co-Extruded Ionomeric Decorative Surfacing

RULE 131 DECLARATION

Commissioner for Patents  
P.O. Box 1450  
Alexandria VA 22313-1450

Sir:

I, Lori J. Pike, declare that:

I am a citizen of the United States of America residing in Newark, Delaware;

I am a co-inventor of the above-identified application for US patent and have read the Office Action mailed 01/10/2007;

I have been employed by E. I. du Pont de Nemours & Company (DuPont) since June 1981 as an engineer working in various areas of plant support, process engineering, and technical service and development of ethylene copolymers including polymers for film and sheet since 1985;

I made several runs of coextruded two layer films comprising ionomer Surlyn<sup>®</sup> film as top layer and another ionomer Surlyn<sup>®</sup> film as second layer well before December 15, 1998;

I had reduced my invention, before December 15, 1998, as described and claimed in the subject application in this country, evidenced by the following exhibits:

Exhibit A, attached hereto, is a photocopy of work request 710802 by me (L. Pike) and operated by Bruce Dennison and Earl Herriman as operators; two runs are shown on this Exhibit A (Sample number E203-56-51 and E203-56-2); the equipment employed was a co-extruder located at DuPont's Chestnut Run facility in Wilmington, Delaware; the resins shown on the farthest left column of the request represents were Surlyn<sup>®</sup> 1706 (zinc ionomer) and Surlyn<sup>®</sup> 7930 (lithium ionomer), both were manufactured and sold by DuPont at that time; Exhibit A also shows that an additive CONPOL 5B10S1 was present in one of the

ionomer layers; CONPOL was used as antiblock and slip agent additive with different concentrations (0.05 wt % and 0.01 wt %) in the two runs;

Several other two layer films were also made similarly; for example, Exhibit B (work request 150405) shows four (4) two-layer runs (sample numbers E229-41-1, E229-41-2, E229-41-3, E229-41-4); each of runs E229-41-1 and E229-41-2 comprised Surlyn® 1601 film as top layer and another Surlyn® NWL film as second layer; each of run E229-41-3 and E229-41-4 comprised Surlyn® HT 2010 film as top layer and another Surlyn® NWL film as second layer; Surlyn® 1601 and Surlyn® NWL were each a sodium ionomer; Surlyn® HT 2010 was a high transparency sodium ionomer grade.

Exhibit C includes 6 runs (E203-31-1 to E203-31-6) of Surlyn®/Surlyn® 2-layer structures. I measured the thickness of each Surlyn® layer, one of the runs, sample number E203-31-5, had thickness of 6 mils for one layer and 2 mils for another layer. The total thickness of 8 mils is within the range recited in the above-identified claims (*see, e.g., claim 1*).

As shown in the attachment to this declaration, DuPont technical literature shows that of these two layers structures, the Surlyn® NWL has a gloss of 82 at 20° angle and Surlyn® 1601 has a gloss of 75. Such gloss values are as recited in applicants' claims (69-71).

Not shown are more ionomer/ionomer two-layer runs carried out by me, but the above-illustrated two exhibits unequivocally demonstrate that I conceived and reduced to practice the invention claimed in the above-identified application before the filing date of the parent application of the Smith reference relied on by the examiner; and

I further declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

  
Lori J. Pike  
3/30/07  
Date

## EXHIBIT A

## EXTRUSION DATA RECORD ... BLOWN FILM

WORK REQUEST NO. 710802				DATE				SCREW 9-292-27 / G.				
OPERATOR/ENGINEER HERRIMAN / L. PIKE				EXTRUDER 2 1/2" WELEX / 1 1/2" DAVIS				DIB Gloucester 2-LAYER				
RESIN	DATA LOT NUMBER	SAMPLE NUMBER	REAR	BARRIL TEMP. °F (SET/READ)		DIE TEMP. °F (SET/READ)		MELT Temp. °F	TOWER HEIGHT	SCREW SPEED RPM	KMAX OUTLET PSI	CHILL ADAPTOR PSI
				CENTER FRONT	REAR	CENTER FRONT	REAR					
Surlyn 7930	30717955	E203-56-1	350	400	425	435	435	435	435	61	76	2800
Surlyn 7930	30260013											
Surlyn 7930	30317879		375	415	435	435	435	435	435	110	22	1990
Surlyn 7930		E203-56-2	350	400	425	435	435	435	435	61	76	2230
Surlyn 7930			375	415	435	435	435	435	435	110	22	1980

## EXHIBIT B

## EXTRUSION DATA RECORD -- BLOWN FILM

WORK REQUEST NO. 150405		DATE		SCREW 9-297-27										
OPERATOR/ENGINEER DENNISON / PIKE		EXTRUDER 2 1/2 WELER / 1 1/2 DAVIS - COEX		DIE 6 LOUCESIDE										
RESIN TYPE	LOT NUMBER	SAMPLE NUMBER	BARRIEL TEMP. °F (SET/READ)			DIE TEMP. °F (SET/READ)			TOWER HEIGHT	TOWER ANGLE	SPEED RPM	HIPS	ADJUSTOR PSI	
			REAR	CENTER	FRONT	REAR	CENTER	FRONT						REAR
SURBON 1601 WELER		E229-41-1	350	375	390	400	400	400	400	400	400	86	74	3520
SURBON 1601 WELER			350	375	390	400	400	400	400	400	100	84	3560	
" WELER														
SURBON 1601 WELER		E229-41-2	350	375	390	400	400	400	400	400	400	86	74	3520
" WELER			350	375	390	400	400	400	400	400	100	84	3560	
SURBON 1601 WELER		E229-41-3	350	375	390	400	400	400	400	400	400	86	74	3520
SURBON 1601 WELER			350	375	390	400	400	400	400	400	101	83	3570	
SURBON 1601 WELER		E229-41-4	350	375	390	400	400	400	400	400	400	86	71	3550
SURBON 1601 WELER														
		E229-41-5												

## EXHIBIT C

## EXTRUSION DATA RECORD ... BLOWN FILM

N.B. 1

2:251

L.0145

EXTRUDER 2 1/2" WELCH 1 1/2" DAVID

DATE

SCREW

DIB GLOUCHESTER 2-LAYER

SCREENS

SPECIAL SITU UP

NO. 6883

P. 15

OPERATOR:

WITNESS:

PA

CS:

PAGE 15/17 \* RCVD AT 4/3/2007 1:27:12 PM [Eastern Daylight Time] \* SVR:USPTO-EFXXRF-2/2 \* DNS:2738300 \* CSID:302 992 3257 \* DURATION (mm-ss):05-22

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# SURLYN® 1601

Ionomer Resin

## Product Information

### For Blown and Cast Film

#### Description

SURLYN® 1601 is an ionomer resin available for use in conventional blown and cast film extrusion and coextrusion equipment designed to process polyethylenic resins.

#### Features/Benefits vs. SURLYN 1601-2

- Lower gel levels for better package appearance and better product visibility

#### Typical Applications

- Meat, poultry, seafood, and cheese packaging
- Cereal liners
- Medical/pharmaceutical packaging
- Powdered/granular food and nonfood pouches

- Carded display/skin packaging films
- Edible oil, motor oil, and other liquid product pouches
- Snack structures
- Coextrusions with nylon or in other film structures as a heat seal

Note: Typically clear films of this SURLYN and other sodium SURLYN resins can whiten in contact with water, steam, or some aqueous solutions. Sealing and other film properties are not affected, however. Films of zinc SURLYN resins do not whiten as the sodium SURLYN resins do.

**TABLE 1**  
Properties of SURLYN® 1601

Resin Property	Typical Value	Test Method
Melt Flow Index dg/min	1.3	ASTM D1238 Cond. 190°C/2.16 kg
Melt Point, °C (°F)	98 (208)	ASTM D3418 (DSC)
Freeze Point, °C (°F)	68 (154)	ASTM D3418 (DSC)
Vicat Softening Point °C (°F)	74 (165)	ASTM D1525
Ion Type	Sodium	—
Density, g/cc	0.94	ASTM D792

**TABLE 2**  
Properties of SURLYN® 1601

Film Property (2 mil Blown, 3:1 BUR)	Typical Value	Test Method
Ultimate Tensile Strength MD, MPa (psi) TD, MPa (psi)	33.8 (4900) 40.7 (5900)	ASTM D882
Ultimate Elongation MD/TD, %	350/400	ASTM D882
Secant Modulus MD, MPa (psi) TD, MPa (psi)	241 (35,000) 262 (38,000)	ASTM D882
Spencer Impact Strength J/mm (in-lb/mil)	31 (7.0)	ASTM D3420
Dart Drop Strength g/μm (g/mil)	11.8 (300)	ASTM D1709 Method B
Elmendorf Tear Strength MD, mN/μm (g/mil) TD, mN/μm (g/mil)	6.9 (18) 7.3 (19)	ASTM D1922
Gloss, 20°	75	ASTM D2457
% Haze	3.0	ASTM D1003

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# SURLYN® NWL

Ionomer Resin

## Product Information

### For Blown and Cast Film

#### Description

SURLYN® NWL is an ionomer resin available for use in conventional blown and cast film extrusion and coextrusion equipment designed to process polyethylene resins. Film produced from this resin is especially suited for skin packaging.

#### Applications

Skin packaging of items with highly glossy surfaces can often result in entrapment of air bubbles between the product and the film. This mottled appearance is termed "wet look" because it resembles water droplets trapped between the film and the surface. SURLYN NWL (Non-Wet Look) is a resin that was specially developed to address this problem. Made into film, and skin packaged on standard skin packaging equipment, it eliminates the wet look on most products.

For optimum results, SURLYN NWL should be converted in a film coextrusion with SURLYN 1601. The SURLYN NWL layer would be skin packaged against the product and the SURLYN 1601 layer would be on the outside.

#### Processing Information

SURLYN NWL is normally processed at melt temperatures ranging from 205° to 227°C (400° to 440°F) in blown film equipment. A typical extruder temperature profile is shown in Table 3. Actual processing temperatures will usually be determined by either the specific equipment or one of the other polymers in a coextrusion. SURLYN NWL can also be used in cast extrusions and coextrusions.

Materials of construction used in the processing of this resin should be corrosion resistant. Stainless steels and/or duplex chrome or nickel plating are recommended for dies and adapters.

If surface properties of the extruded resin require modification (for example, lower coefficient of friction for packaging machine processing), refer to the CONPOL™ Processing Additive Resins product information available from your nearest Du Pont Packaging Products sales office.

TABLE 1  
Properties of SURLYN® NWL

Resin Property	Typical Value	Test Method
Melt Flow Index dg/min	1.3	ASTM D1238 Cond. 190°C/2.16 kg
Melt Point, °C (°F)	98 (205)	ASTM D3418 (DSC)
Freeze Point, °C (°F)	61 (142)	ASTM D3418 (DSC)
Vicat Softening Point °C (°F)	72 (162)	ASTM D1525
Ion Type	Sodium	—
Density, g/cm <sup>3</sup>	0.94	ASTM D792

TABLE 2  
Properties of SURLYN® NWL

Film Property (5 mils blown coex:4 mils SURLYN 1601, 1 mils SURLYN NWL)	Typical Value	Test Method
Ultimate Tensile Strength MD, MPa (psi) TD, MPa (psi)	26.9 (3,900) 26.5 (3,850)	ASTM D882
Ultimate Elongation MD/TD, %	450/475	ASTM D882
Secant Modulus MD, MPa (psi) TD, MPa (psi)	172 (25,000) 174 (22,200)	ASTM D882
Spencer Impact Strength J/mm (in-lb/mil)	1.3 (5.8)	ASTM D3420
Elmendorf Tear Strength MD, mN/μm (g/mil) TD, mN/μm (g/mil)	12.8 (33.1) 13.8 (35.9)	ASTM D1922
Gloss, 20° In (Out)	82 (55)	ASTM D2457
% Haze	7.3	ASTM D1003

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